IN THE CLAIMS

1. (Currently Amended) A device for regulating a voltage supply to a semiconductor device, said device comprising:

a memory for storing a plurality of performance ranges, wherein each performance range of said plurality of performance ranges is associated with a respective different supply voltage and each performance range of said plurality of performance ranges has a performance limit of the semiconductor device associated therewith;

a measuring function for measuring a performance of said semiconductor device;

a reference circuit; and

a regulator; wherein

~~wherein~~ the memory, the reference circuit and the regulator are arranged to determine a lowest supply voltage required to maintain a performance of the semiconductor device at a given operational frequency and to modify the supply voltage to said semiconductor device if a measured performance of said semiconductor device is not within a predetermined portion of a performance range associated with said voltage supplied to said semiconductor device.

2. (Previously presented) A device according to claim 1, wherein said performance limits stored in the memory are based on two parameters, the first parameter being current resistance drop value and the second parameter being an accuracy of the regulator.

3. (Previously presented) A device according to claim 1, wherein said performance range is defined to have an upper performance limit such that if said measured performance of the semiconductor device is above said upper performance limit said regulator is arranged to reduce said voltage supplied to said semiconductor device.

4. (Previously presented) A device according to claim 1, wherein said performance range is defined to have a lower performance limit such that if said measured performance of said semiconductor device is below said lower performance limit said regulator is arranged to increase said voltage supplied to the semiconductor device.

5. (Previously presented) A device according to claim 1, wherein said performance range is defined to have a critical lower performance limit such that if said measured performance of said semiconductor device is below said critical lower performance limit said regulator is arranged to increase said voltage supplied to said semiconductor device.

6. (Previously presented) A device according to claim 1, wherein said measuring function is arranged to measure said performance of said semiconductor device by measuring said performance of a reference circuit that forms part of said semiconductor device.

7. (Previously presented) A device according to claim 6, wherein said plurality of performance ranges are arranged to include a performance guard margin to compensate for differences between said measured performance of said reference circuit and an actual performance of a complete integrated circuit.

8. (Previously presented) A device according to claim 1, further comprising a ring oscillator, wherein said measuring function measures a frequency of said ring oscillator for providing a measure of said performance of an integrated circuit.

9. (Previously presented) A method for regulating a voltage supply to a semiconductor device, said method comprising:

storing a plurality of performance ranges of the semiconductor device, wherein each performance range of said plurality of performance ranges is associated with a respective different supply voltage and each performance range of said plurality of performance ranges has a performance limit of the semiconductor device associated therewith;

measuring a performance of said semiconductor device;

determining a lowest supply voltage required to maintain a performance of the semiconductor device at a given operational frequency; and

modifying said supply voltage to said semiconductor device if a measured performance of said semiconductor device is not within a predetermined portion of a performance range associated with said voltage supplied to said semiconductor device.

10. (Previously presented) A device for regulating a voltage supply to a semiconductor device according to claim 1, wherein the memory also stores a plurality of process temperature compensation voltage values, wherein said respective process temperature compensation voltage values are associated with a respective operational frequency for said semiconductor device, such that if said operational frequency of said semiconductor device changes to a new operational frequency, said supply voltage is modified by said regulator to substantially a same value as said process temperature compensation voltage value associated with said new operation frequency.

11. (Previously presented) A device according to claim 10, wherein each process temperature compensation voltage value associated with a respective operational frequency is determined from a plurality of performance ranges stored in said memory wherein said respective performance ranges are associated with a respective supply voltage.

12. (Previously presented) A device according to claim 11, wherein said regulator is arranged to modify said supply voltage to said semiconductor device if a measured performance of said semiconductor device is not within a predetermined portion of a performance range associated with said voltage supplied to the semiconductor device for a given frequency.

13. (Previously presented) A device according to claim 12, wherein said performance range is defined to have an upper performance limit such that if said measured

performance of said semiconductor device is above said upper performance limit said regulator is arranged to reduce said voltage supplied to said semiconductor device.

14. (Previously presented) A device according to claim 12, wherein said performance range is defined to have a lower performance limit such that if said measured performance of said semiconductor device is below said lower performance limit said regulator is arranged to increase said voltage supplied to said semiconductor device.

15. (Previously presented) A device according to claim 12, wherein said performance range is defined to have a critical lower performance limit such that if said measured performance of said semiconductor device is below said critical lower performance limit said regulator is arranged to increase said voltage supplied to said semiconductor device.

16. (Previously presented) A device according to claim 12, wherein said measuring function is arranged to measure the performance of said semiconductor device by measuring said performance of a reference circuit that forms part of said semiconductor device.

17. (Previously presented) A device according to claim 16, wherein said plurality of performance ranges are arranged to include a performance guard margin to compensate for differences between said measured performance of said reference circuit and an actual performance of said semiconductor device.

18. (Previously presented) A device according to claim 12, further comprising a ring oscillator, wherein said measuring function measures a frequency of said ring oscillator for providing a measure of the performance of the semiconductor device.

19. (Previously presented) A method for regulating a voltage supply to a semiconductor device, according to claim 9 wherein:

said step of storing comprises storing a plurality of process temperature compensation voltage values, wherein respective process temperature compensation voltage values are associated with a respective operational frequency for said semiconductor device; and

said step of modifying comprises modifying a supply voltage to said semiconductor device if an operational frequency of said semiconductor device changes to a new operational frequency, wherein said supply voltage is modified to substantially a same value as a process temperature compensation voltage value associated with said new operational frequency.

20. (Previously presented) A device for regulating a voltage supply to a semiconductor device, said device comprising:

a memory for storing a plurality of process temperature compensation voltage values, wherein each of said plurality process temperature compensation voltage values are respectively associated with a different operational frequency for said semiconductor device; and

a regulator for modifying said supply voltage to said semiconductor device if said operational frequency of said semiconductor device changes to a new operational frequency; wherein

the memory stores a performance limit of the semiconductor device, the memory, the reference circuit and the regulator being arranged to determine a lowest supply voltage required to maintain a performance of the semiconductor device at a given operational frequency and modify said supply voltage to substantially a same value as a process temperature compensation voltage value associated with said new operational frequency.

21. (Previously presented) A device according to claim 20, wherein said performance limit stored in the memory is based on a current resistance drop value and an accuracy of the regulator.

22. (Previously presented) A device according to claim 20, wherein each process temperature compensation voltage value associated with a respective operational frequency is determined from a plurality of performance ranges stored in said memory wherein said respective performance ranges are associated with a respective supply voltage.

23. (Previously presented) A device according to claim 22, further comprising a measuring function for measuring the performance of the semiconductor device, wherein said regulator is arranged to modify said supply voltage to said semiconductor device if a measured performance of the semiconductor device is not within a predetermined portion of a performance range associated with said voltage supplied to said semiconductor device for a given frequency.

24. (Previously presented) A device according to claim 23, wherein said performance range is defined to have an upper performance limit such that if said measured performance of said semiconductor device is above said upper performance limit said regulator is arranged to reduce said voltage supplied to said semiconductor device.

25. (Previously presented) A device according to claim 23, wherein said performance range is defined to have a lower performance limit such that if said measured performance of said semiconductor device is below said lower performance limit said regulator is arranged to increase said voltage supplied to said semiconductor device.

26. (Previously presented) A device according claim 23, wherein said performance range is defined to have a critical lower performance limit such that if the measured performance of said semiconductor device is below said critical lower performance limit said regulator is arranged to increase said voltage supplied to said semiconductor device.

27. (Previously presented) A device according to claim 23, wherein said measuring function is arranged to measure the performance of said semiconductor device by

measuring said performance of a reference circuit that forms part of said semiconductor device.

28. (Previously presented) A device according to claim 27, wherein said plurality of performance ranges is are arranged to include a performance guard margin to compensate for differences between said measured performance of said reference circuit and an actual performance of said semiconductor device.

29. (Previously presented) A device according to claim 23, further comprising a ring oscillator, wherein said measuring function measures a frequency of said ring oscillator for providing a measure of a performance of the semiconductor device.

30. (Previously presented) A method for regulating a voltage supply to a semiconductor device, said method comprising:

storing a plurality of process temperature compensation voltage values, wherein each of said plurality of process temperature compensation voltage values are respectively associated with a different operational frequency for said semiconductor device; and

modifying a supply voltage to said semiconductor device if an operational frequency of said semiconductor device changes to a new operational frequency;

determining a lowest supply voltage required to maintain a performance of the semiconductor device at a given operational frequency; and

modifying said supply voltage to substantially a same value as a process temperature compensation voltage value associated with said new operational frequency.